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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,218	01/03/2006	Yasuaki Wakizaka	Q76492	1434

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EXAMINER	
WANG, CHUN CHENG	

ART UNIT	PAPER NUMBER
1796	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,218	WAKIZAKA ET AL.	
	Examiner	Art Unit	
	Chun-Cheng Wang	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/03/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. JP 2003-207884, filed on 08/19/2003 and JP 2003-191881, filed on 07/04/2003. Claims 1-36 are pending.

Claim Objections

2. Claims 16-18 are objected to because of the following informalities: Change "characterized in that" to "wherein". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-8, 10, 15-16, 20, 24-26, 30-32 and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Datye et al. ("Photothermal Heterogeneous Oxidation of Ethanol over Pt/TiO_2, 1998 Journal of Catalysis 179, 375-389, Academic Press).

Datye et al. disclose Photothermal catalytic oxidation of ethanol over TiO_2 and Pt/TiO_2 has been investigated (read on claim 10). Platinum was deposited on the titania using both photoreduction and adsorption of the $PtCl_6^{2-}$ anion (read on claims 1, 5-8 and 20). The nominal weight loadings of Pt were less than 1 wt% (read on claim 4) (Abstract, page 375). Degussa P25 TiO_2, which has become a standard in photocatalysis research, was used in these studies. P25 has

consistently exhibited superior photocatalytic efficiencies when compared to other titanias in liquid-phase photocatalysis research. It is produced by flame hydrolysis of $TiCl_4$ at a temperature greater than 1473 K in the presence of O_2 and H_2. The titanium dioxide has a mean specific surface area (BET) of 50 m^2/g (read on claim 15), and consists of nonporous primary crystallites in the size range of 20–30 nm (page 378, Titania Photocatalyst). Sample of Pt particle size of < 1 nm was produced (read on claim 3) (page 379, TABLE 1). Photoreduced Pt/TiO_2 catalysts were prepared by creating aqueous slurry of P25 TiO_2, adding an appropriate amount of chloroplatinic acid, $H_2PtCl_6 \cdot 6H_2O$, with an equimolar amount of ethanol, and irradiating with a 150-W Hg-Xe lamp for an hour while stirring the solution vigorously. The resulting Pt/TiO_2 (read on claim 24) catalysts were either centrifuged or filtered, washed with an equal volume of water, and dried (read on claims 25-26) at about 398 K (page 378, *Pt/TiO_2 Photocatalyst Preparation and Characterization*). An annular photo-reactor used in the studies. Uniform TiO_2 film deposition was accomplished by evenly distributing TiO_2 slurry inside the Pyrex reactor and evaporating the slurry to dryness while continuously spinning a Pyrex glass tube. The uniformity of deposition could both be seen visually and qualitatively verified by TiO_2 UV absorption measurements of TiO_2 particulate films deposited on Pyrex glass microscopic slides (read on claim 34) under similar conditions. TiO_2 (Degussa-P25) with a BET surface area of 50 m^2/g was coated from an aqueous slurry on the inside surface of the photo-reactor Pyrex tube. Careful handling procedures and long equilibrium times were required to allow both the substrate and TiO_2 loaded substrate to reach equilibrium with atmospheric water after being out gassed at about 398 K for 30 min (page 377, *Photo-Reactor System*). A thin film of Pt/TiO_2 was deposited in the same manner (read on claims 30-32 and 34-36) (page 386, *Layered Bed experiment*).

5. Claims 1, 4-7, 10, 16, 20, 24, 27-32 and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsujimichi et al. (EP1053788 A1).

Tsujimichi et al. disclose sol mixture comprises titanium dioxide (e.g. photocatalyst, read on claims 1 and 10) and metal of palladium, nickel and platinum (read on claims 1, 5-7, 16 and 24) ([0036]). The sol has metal to titanium dioxide mass ratio of 0.00001 to 0.05 (i.e. 0.00001 to 0.048, read on claim 4) ([0035]). $TiCl_4$ can be used as starting material ([0182]). Tsujimichi et al. also disclose photocatalyst-containing material dispersed in paint or a glaze (read on claims 27 and 28) (claim 15). A photocatalytically activable material comprises a substrate layer and a surface layer, the surface layer comprises the photocatalyst formulation (claim 18). Tile was prepared by spray-coating a photocatalyst sol having a titanium dioxide content of 7.5% by weight onto the surface ([0108], read on claims 1). Tsujimichi et al. further disclose a tile coated with TiO_2+Al_2O_3+SiO_2+Pt (read on claims 29, 30 34-36) (page 30, Table 4). In forming the surface layer, the heat treatment is carried out at a temperature of about 150°C to about 1300°C (read on claims 31-32) ([0066], lines 55-56).

6. Claims 1, 4-8, 10, 16, 20 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (WO 00/04993).

Park et al. disclose a photocatalyst comprises TiO_2 and Pt can convert methane into low carbohydrates (read on claims 1 and 16). Pt is in an amount of 0.5 to 3.5 weight % based on the total weight of the photocatalyst (read on claims 1, 4-8 and 10). The suspension is homogeneously mixed, completely dried and sintered to prepare the photocatalyst (read on

claims 24-26) (Abstract). Example of salts used to prepare the photocatalyst include $PdCl_2$ and $H_2PtCl_6 \cdot xH_2O$ (read on claims 8 and 20) (page 8, lines 22-24).

7. Claims 1, 5-7, 10, 12-14, 16-19, 21-30 and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (US 20010046944 A1).

Ito et al. disclose a photocatalytic powder (read on claims 25) containing titanium dioxide fine particles containing an anionically active substance in an aqueous environment at pH 5, a photocatalytic slurry containing the powder, a polymer composition (read on claims 27 and 28), a coating agent (wherein binder material includes at least one material selected from the group consisting of polyvinyl alcohol, sodium polyacrylate, poly (N-vinylacetamide) and zirconium compound ([0040]), read on claim 29), a photocatalytic functional molded article (read on claims 35-36), a photocatalytic functional structure using the powder (Abstract) and a coating layer comprising the photocatalytic powder (read on claim 30) ([0028]). Ito et al. disclose in the photocatalytic powder, a metal such as platinum, rhodium, ruthenium, palladium, silver, copper and zinc may be previously supported on the surface of a titanium dioxide fine particle ([0037]). The content ratio of the photocatalytic powder in the slurry is from about 0.01 to about 50% by mass (read on claims 1, 5-7, 10 and 16) ([0039]). Ito et al. also disclose a titanium dioxide fine particle obtained by a vapor phase reaction starting from titanium halide, a titanium dioxide fine particle or sol obtained by wet-hydrolyzing a titanium halide solution, or a calcined product thereof, may be used ([0029]). In a 1 L-volume flask, 476 ml of pure water was weighed, heated while stirring with a lab stirrer and kept at a temperature of 98°C. Thereto, 36 g of Aqueous Titanium Tetrachloride Solution was added dropwise over 60 minutes. After the dropwise addition, the obtained white suspension was adjusted to pH 5 (read on claims 1, 17-19 and 21-

24). The dry powder (read on claims 25-26) was subjected to a structural analysis using an X-ray diffractometer, and the obtained powder was brookite-type titanium dioxide (read on claims 12-14) (Example 4). Ito et al. disclose medium (structure or coating) for coating on a structure (organic material), such as paper, plastic, cloth or wood, or on a body coating of a car (read on claims 34-36) ([0046]).

Claim Rejections - 35 USC § 102/103

8. Claims 2, 9 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Datye et al. ("Photothermal Heterogeneous Oxidation of Ethanol over Pt/TiO_2, 1998 Journal of Catalysis 179, 375-389, Academic Press).

The disclosure of Datye et al. is adequately set forth in paragraph 4 and is incorporated herein by reference.

Regarding claim 2: Datye et al. disclose substantially identical sol as in claims 1 and 8 therefore the sol will have a transmittance of 50% or more at a wavelength of 550 nm.

Regarding claim 9: Datye et al. disclose substantially identical sol as in claim 1 therefore the sol will exhibits peaks at 72.5 eV and 75.5 eV, as measured through X-ray photoelectron spectroscopy.

Regarding claim 11: Datye et al. disclose substantially identical sol as in claim 1 therefore the solid component of the sol exhibits a diffraction peak of lattice constant d (Å) of 2.90, as measured through powder X-ray diffraction employing Cu--Kα1 rays.

Since PTO does not have proper means to conduct experiments, the burden of proofs is now shifted to applicants to show otherwise. ***In re Best***, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); ***In re Fitzgerald*** 205 USPQ 594 (CCPA 1980).

9. Claims 2, 11 and 15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ito et al. (US 20010046944 A1).

The disclosure of Ito et al. is adequately set forth in paragraph 7 and is incorporated herein by reference.

Regarding claim 2: Ito et al. disclose substantially identical sol as in claims 1 and 8 therefore the sol will have a transmittance of 50% or more at a wavelength of 550 nm.

Regarding claim 11: Ito et al. disclose substantially identical sol as in claim 1, therefore the solid component of the sol will exhibit a diffraction peak of lattice constant d (Å) of 2.90 by powder X-ray diffraction employing Cu-Kα1 rays.

Regarding claim 15: Ito et al. disclose substantially identical sol as in claim 1, therefore the solid component of the sol would has a BET specific surface area of 20 to 400 m^2/g.

Since PTO does not have proper means to conduct experiments, the burden of proofs is now shifted to applicants to show otherwise. ***In re Best***, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); ***In re Fitzgerald*** 205 USPQ 594 (CCPA 1980).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 20010046944 A1).

The disclosure of Ito et al. is adequately set forth in paragraph 7 and is incorporated herein by reference.

Ito et al. is silent on the thin film hardening temperature.

Ito et al. disclose medium (structure or coating) for coating on a structure (organic material), such as paper, plastic, cloth or wood, or on a body coating of a car (read on claims 34-36) ([0046]).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to adjust temperature for heat treatment the coating film according to the substrate material, especially paper and/or cloth, under 60°C to prevent burning or damage the substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Cheng Wang whose telephone number is (571)270-5459. The examiner can normally be reached on Monday to Friday w/alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/
Primary Examiner, Art Unit 1796

Chun-Cheng Wang
Examiner, Art Unit 1796

/CCW/